



OFG – 32X,  
PFG – 690,  
And  
OFG – 390

Ignition Module  
Information



## Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers

Introduction.....	1
Specifications .....	2
Model Number Designation .....	2
Normal Operation.....	5
OFG – 32X Gas Open Fryers.....	9
Ignition Module Circuit .....	10
Circuit Description.....	11
PFG – 690 and OFG – 390 Fryers .....	12
Ignition Module Circuit .....	13
Circuit Description.....	14
Important Service Issues .....	16
Troubleshooting Flowchart .....	17



# Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers

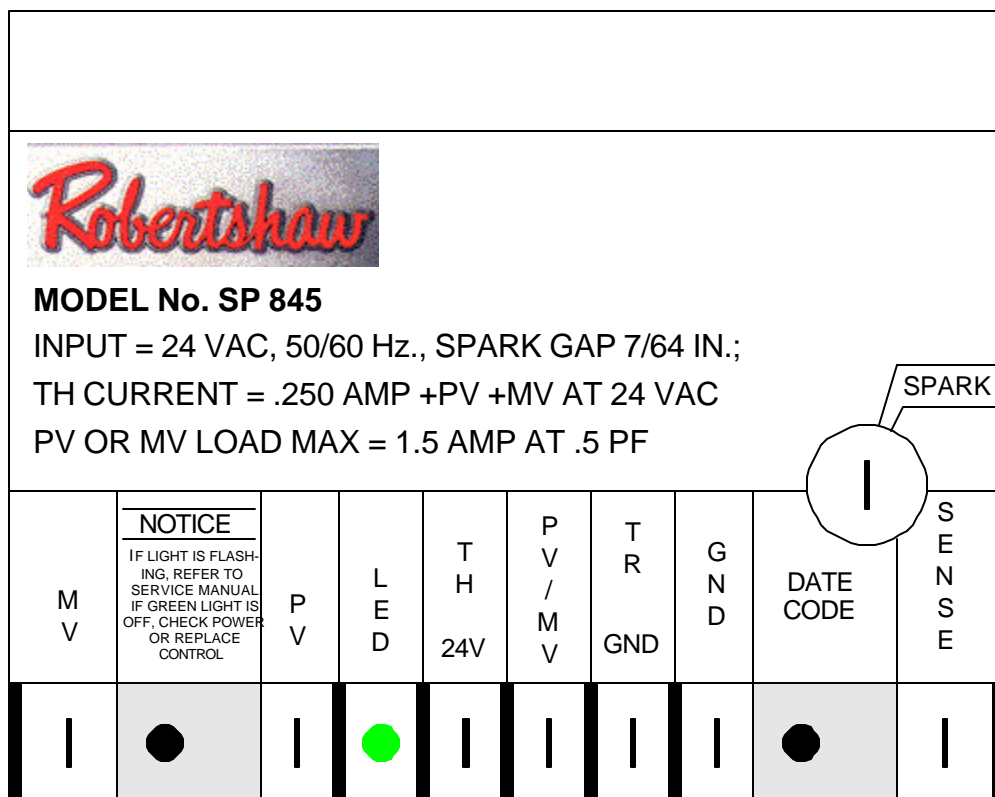
## Introduction

The ignition module used for the Henny Penny OFG-32X, OFG-390, and PFG-390 gas fryers is made by Robertshaw.

The Model no. of the ignition module is SP 845. This ignition module uses a direct spark ignition system. The flame is proven by using the flame rectification principle.

This document will help you understand how the ignition module, itself, works and how it is used in the previously mentioned equipment.

Below is a drawing of the ignition module.





## Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers

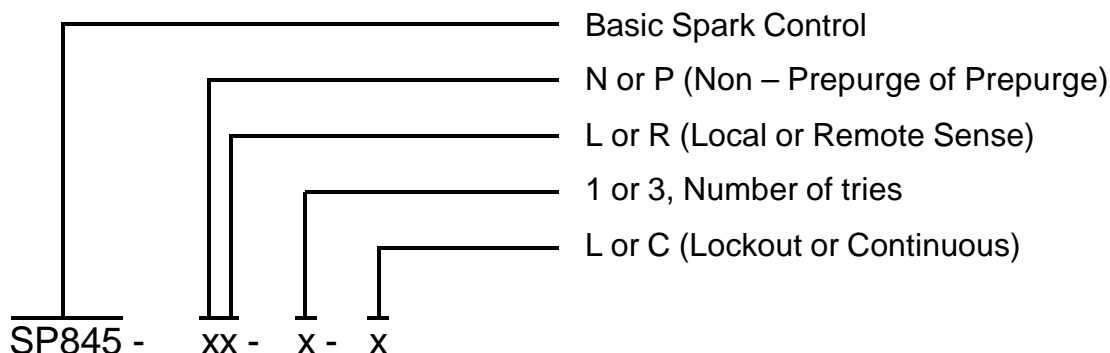
### Specifications

The ignition module operates on 24VAC provided by a step down transformer installed in each fryer.

The ignition module is microprocessor based and contains a diagnostic LED for troubleshooting.

Power Requirements:	18 to 30VAC @ 50/60 Hz.
Operating Temperature:	-40°C to +80°C, -40°F to +176°F
Max. Operating Humidity:	95%R.H. Non-Condensing @ 50°C
Maximum Total Value Load @ 24VAC, 1.5A, 0.5pF	Pilot: 1.0 Amp, 0.5pF Main: 1.0 Amp, 0.5pF
Type of Ignition:	Electronic Spark
Minimum Voltage:	17KVolts
Maximum Voltage:	30KVolts
Spark Gap:	7/64 inch +/- 1/64, 3 mm +/- 0.5 mm
Flame Sense Method:	Flame Rectification
Flame Sense Current:	Must be 0.7 Microamps or Greater with 24VAC applied to the control
Remote sensing:	Connect a DC Microammeter in series with sense lead

### Model Number Designation





## Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers

Henny Penny uses Robertshaw Model SP 845 – NR – 3 – L for the OFG Open Fryers. Part number 54924

Using the designation above, the ignition module that Henny Penny uses has the following specifications:

- Non Prepurge
- Remote Flame Sense
- 3 tries for ignition
- Lockout when it fails to ignite

Trial for Ignition period: 90 seconds

Recycle time: 0 seconds

Flame Failure Response: less than 1 second

Ignition Attempts: 3



## Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers

Henny Penny uses Robertshaw  
Model SP 845 – NR – 3 – C (H.P. 21347) for the PFG – 690 and  
OFG – 390 . Part number 21347

Using the designation above, the ignition module that Henny Penny  
uses has the following specifications:

- Non Prepurge
- Remote Flame Sense
- 3 tries for ignition
- Continuous when it fails to ignite

Trial for Ignition period: 90 seconds

Recycle time: 10 seconds

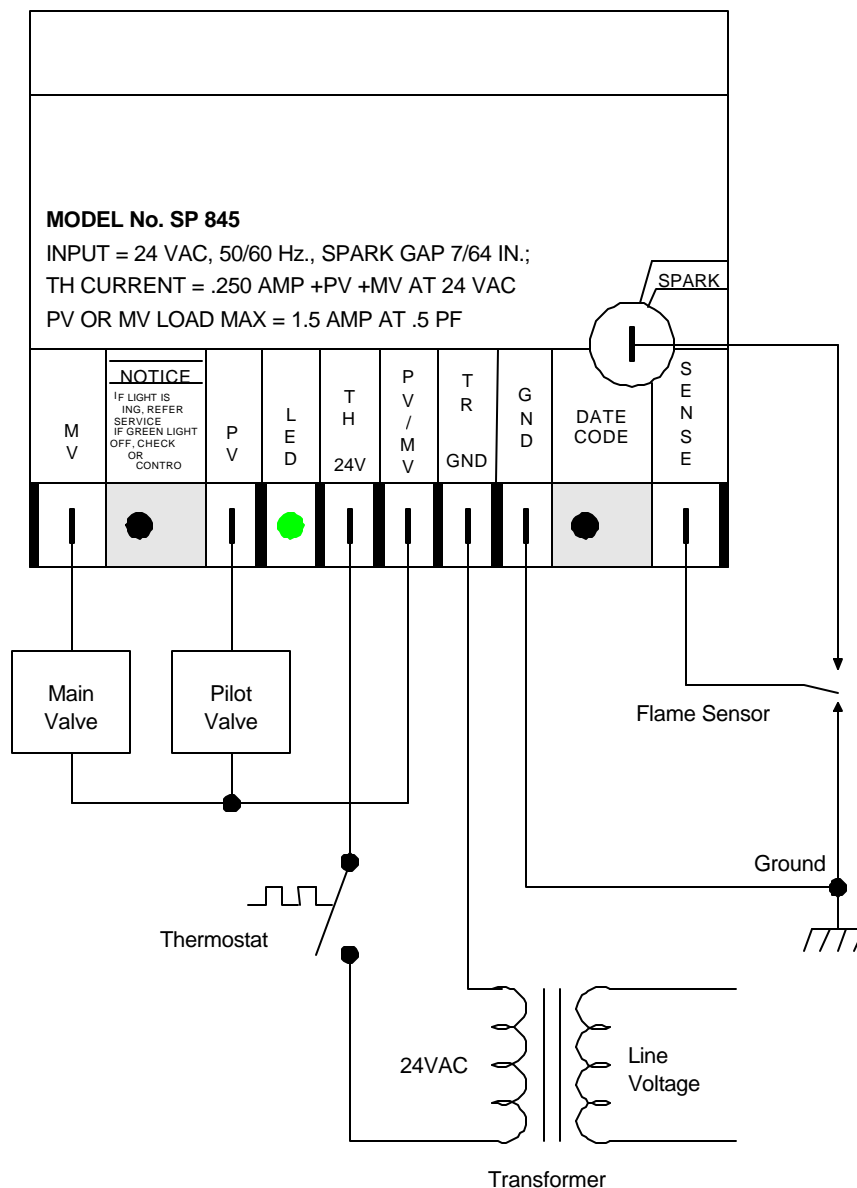
Flame Failure Response: less than 1 second

Ignition Attempts: 3

Actually, this module will count ignition attempts if the module fails to  
see a flame for more than 10 seconds. If the flame is established for  
more than 10 seconds, the module will reset the attempt counter.

## Normal Operation

Using the typical circuit, shown below, the operation of the module will be explained.





## **Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers**

### **Normal Operation (cont.)**

Power to the module is supplied by the step – down transformer shown at the bottom of the drawing on the previous page.

Line voltage is stepped down to 24VAC. One line from the secondary side of the transformer is attached to the (TR Gnd) terminal of the module. The other line, out of the transformer, is connected to a normally open thermostat.

When the thermostat calls for heat, the thermostat will close and then supply the ignition module with 24VAC.

When the module receives the 24VAC, the green LED will turn on, confirming that the module is receiving voltage.

The module will then turn on the PV terminal and send the 24VAC out that pin to the Pilot Valve of the gas valve assembly. At the same time, the high voltage spark will begin.

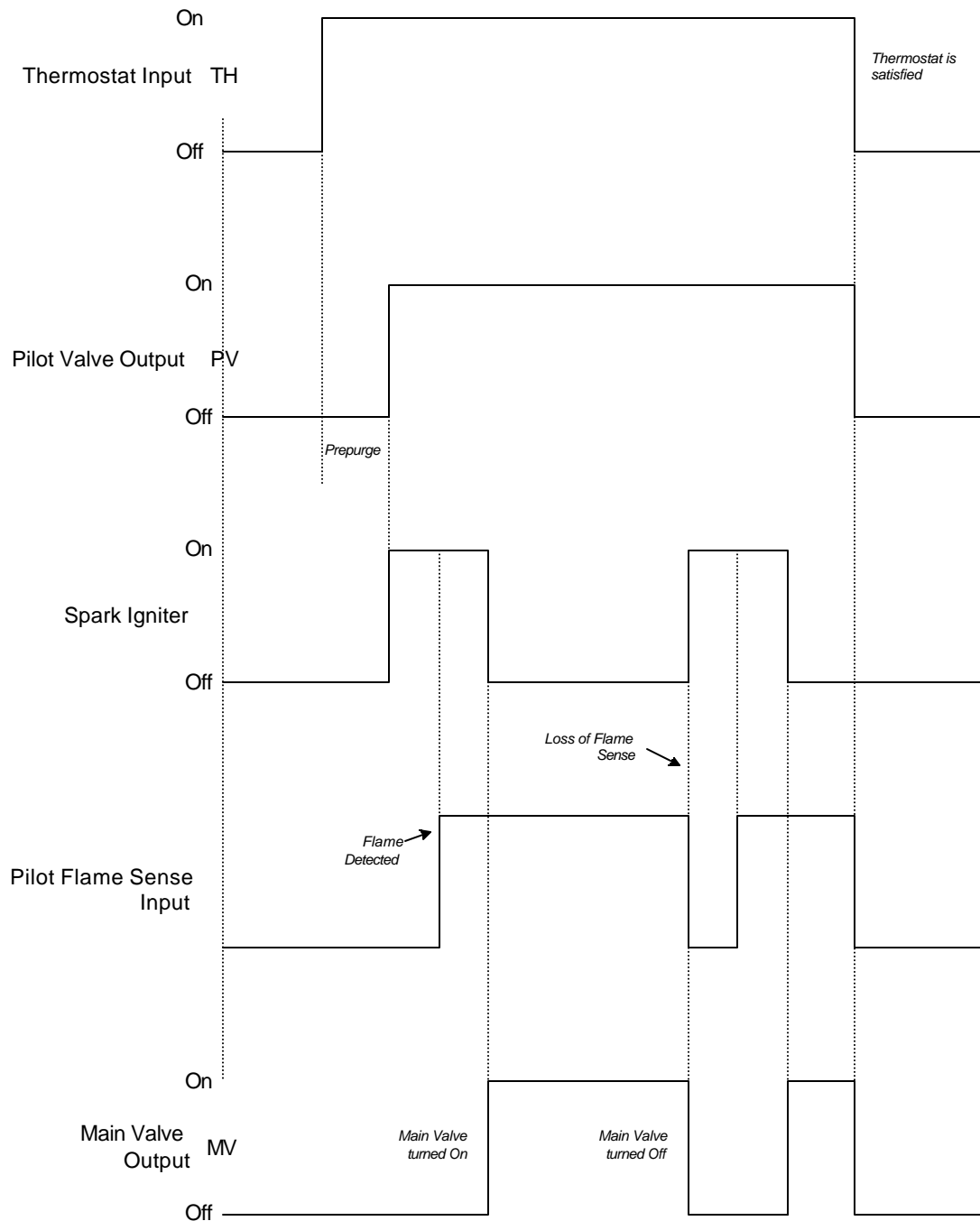
Once the flame is established and the module senses the flame through flame rectification current, the module will turn on the MV terminal and send 24VAC to the Main Valve terminal of the gas valve assembly.

The module will remain in this state until either the flame rectification current drops below 0.7  $\mu$  Amps or the thermostat is satisfied and opens.

On the following page is a timing chart of the ignition module.



## Normal Operation (cont.)





## **Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers**

### **Normal Operation (cont.)**

Should the module fail to detect a flame or lose the flame sense more than 3 times, then the module will go into lockout. The PV terminal will shut down and 24VAC will no longer be sent to the gas valve. In addition, the spark will also not occur. The module will then begin blinking the green LED to alert that the module has gone into lockout.

Should the module lockout, it must be reset. The 24VAC supplying the module must be turned off and then turned back on to reset the module.



## **Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers**

### **OFG – 32X Gas Open Fryers**

Henny Penny does not use the Ignition Module as shown in the typical circuit on the previous section.

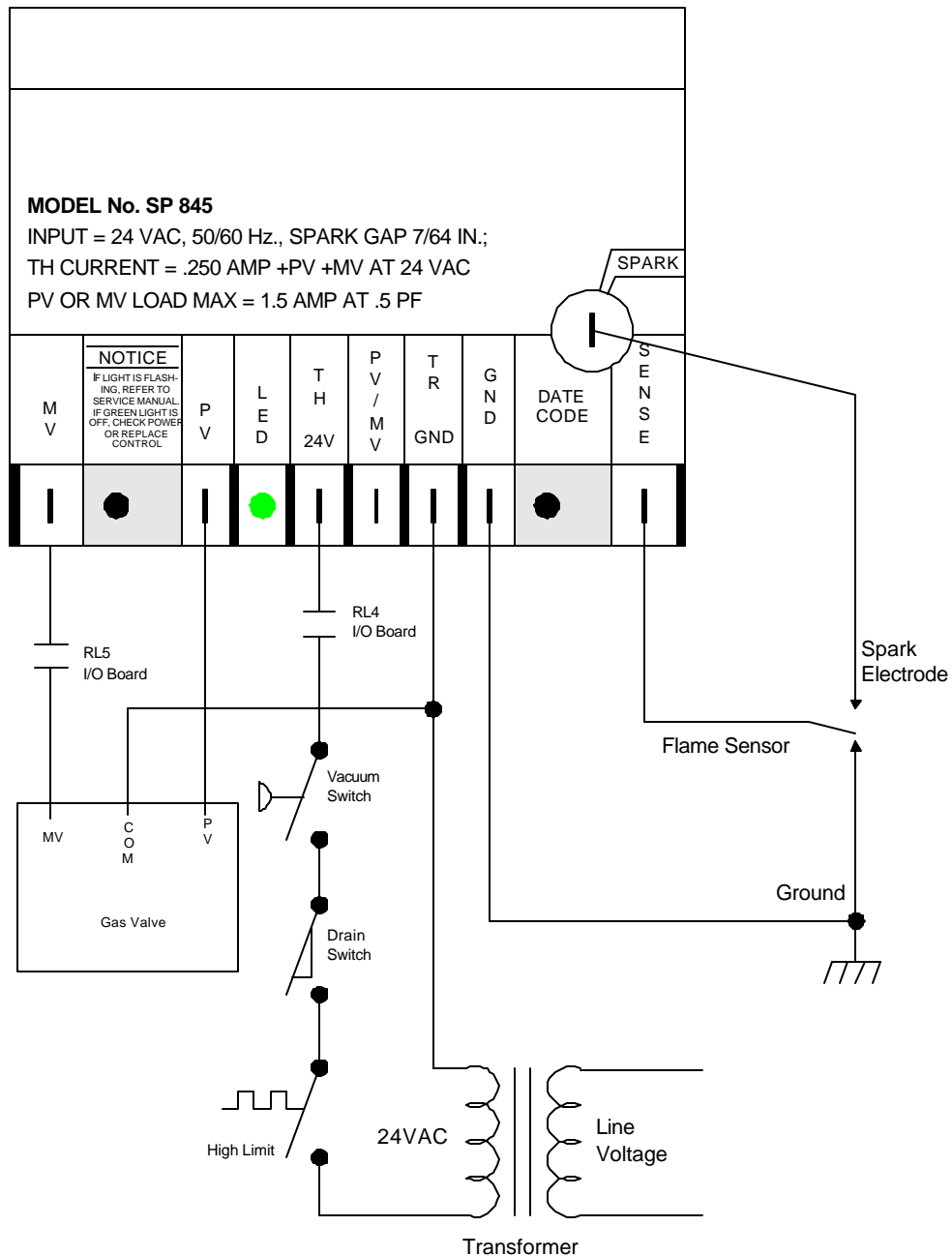
On the OFG – 32X Fryer there is only one Ignition Module, which is used for a two-burner system.

In Henny Penny's wiring of the module, the 24VAC is supplied to the module at all times by the I/O Board of the fryer. This 24VAC is provided constantly, if the safety loop remains in tact. The safety loop consists of the high limit, drain switch, and vacuum switch.

If all three of those devices remain closed, the module will receive voltage until the main power switch is shut off.

The typical circuit for the Henny Penny OFG – 32X Open Fryer is shown on the next page.

**OFG – 32X Gas Open Fryers (cont.)**  
Ignition Module Circuit





## **Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers**

### **OFG – 32X Gas Open Fryers (cont.)**

#### **Circuit Description**

In the OFG – 32X Open Fryer, the voltage from the 24VAC transformer first goes through the safety loop. The safety loop consists of the high limit, drain switch and vacuum switch.

The I/O Board monitors these three safety switches. If all three remain closed then the I/O board will turn relay RL4 on. This supplies the 24VAC to the Ignition Module. The module will then come on. The green LED comes on. The module will then turn on the Pilot Valve and begin sparking.

Once the pilot flame is established and sensed, the MV terminal of the Ignition Module will be turned on and 24VAC will appear at that terminal. The MV terminal is routed to RL5 on the I/O board.

When the control board calls for heat, RL5 will close and send the 24VAC to the Main Valve.

The Ignition Module remains powered as long as the main power switch is on and the safety loop remains in tact. Generally, these conditions will remain throughout the day. The module usually never shuts off.

For a complete description, see the booklet "OFG-323 and OFE-323 Technical Information"



## **Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers**

### **PFG – 690 and OFG – 390 Fryers**

The Henny Penny PFG – 690 and OFG – 390 Fryers differ from the OFG – 32X Fryers.

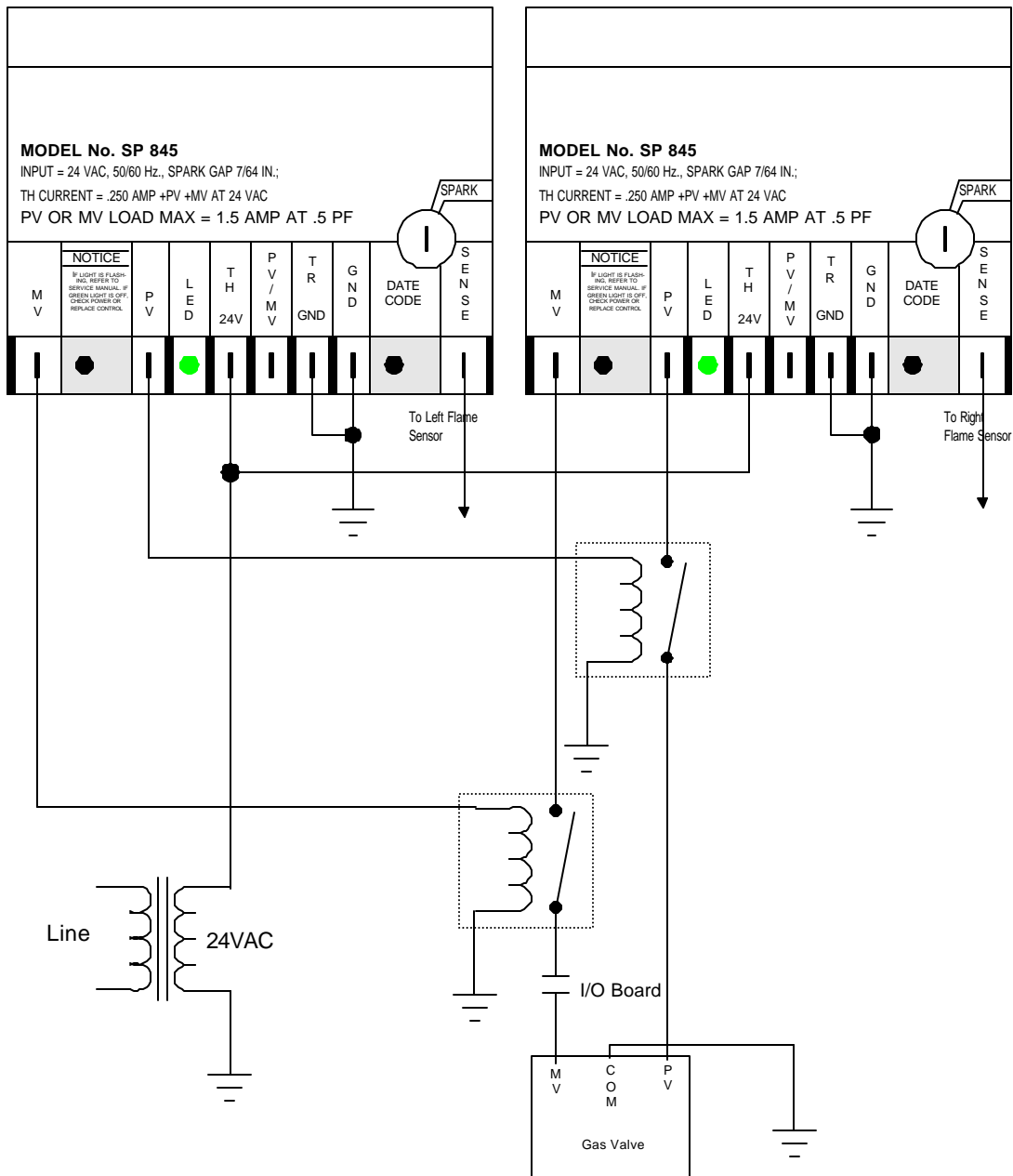
First, there are two modules used. There are two burner assemblies. One Ignition Module is for the left burner and the other module is for the right burner assembly. The ignition modules have different software embedded in them than the Open Fryer modules.

With the PFG – 690 and OFG – 390 Fryers, there is no safety loop between the 24VAC transformer and the Ignition Module. The safety loop is in the high voltage side of the circuit.

The 24VAC transformer is connected directly to the Ignition Modules.

The following page shows the wiring of the two modules.

**PFG – 690 and OFG – 390 Fryers (cont.)**  
Ignition Module Circuit





## Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers

### **PFG – 690 and OFG – 390 Fryers (cont.)**

#### Circuit Description

The safety loop in the PFG – 690 and OFG – 390 Fryers is in the primary (line) side of the 24VAC transformer. The safety loop consists of the high limit, drain switch, and pressure switch (vacuum switch).

Should any of these components open, the primary of the 24VAC transformer will not receive line voltage and the Ignition Modules will shut down.

The Circuit on the previous page only shows the components on the secondary side of the 24VAC transformer.

When the main power switch is turned on, provided that the safety loop is in tact, the primary of the transformer will receive power. The secondary will output 24VAC to both Ignition Modules.

When the Ignition Modules receive power, their green LED's will turn on proving that there are receiving power.

The modules will then turn on their PV terminals. The PV terminals of both modules are connected to a relay, which is mounted on the header of the fryer. The left module's PV terminal is connected to the coil of the relay. The right module's PV terminal is connected to the common contact terminal of the relay.

When the left module's PV turns on, it energizes the coil of the relay. The contacts of the relay will then close. Since the right module's PV terminal is connected to the common terminal of the relay, the right module's PV is applied to the PV of the gas valve.

The Ignition Modules will also begin to spark when they turn on their PV terminals. Once each side's flame has been established and has been sensed, the respective module will turn on its MV terminal.

The left module's MV is again connected to the coil of another relay. The right module's relay is connected to the common contact terminal of this relay.





## Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers

### **PFG – 690 and OFG – 390 Fryers (cont.)**

#### Circuit Description

When the left module sends out the 24VAC from the MV terminal, it causes the relay coil to energize and pulls the contacts of the relay closed. The right module's MV voltage is then routed through the contacts of the relay. The right module's MV 24VAC is then connected to the I/O Board on the control panel header.

The 24VAC MV of the right module "sits" at the I/O Board's heat relay until the control calls for heat.

The modules will remain in this state until the fryer is shut off or if either of the two modules loss flame sense.

If the right module loses flame sense, it will shut down the MV voltage, which feeds through the MV relay to the gas valve and then tries to re-light the right side pilot flame.

If the left module loses flame sense, the left module shuts its MV voltage. This voltage feeds the coil of the MV relay. When the relay coil de-energizes, it opens the contacts of the MV relay. This causes the MV voltage of the right module to not reach the gas valve. The left module will try to re-light its pilot flame.

The Ignition Modules are in effect connected in series, if either module fails, the gas valve will not receive the voltage it needs to operate.

Should one of the modules fail to sense the flame for less than 10 seconds more than three times in a row, it will go into lockout. The PV of the respective module will shut down and the PV relay will be affected the same way the MV relay was described previously.

The module which has not gone into lockout will try to re-light, even though the gas valve does not receive voltage, until it reaches three tries and then that module will go into lockout.



## **Ignition Module for OFG-32X, PFG-690, and OFG-390 Gas Fryers**

### **Important Service Issues**

Should the Ignition Modules lose flame sense three times they will go into lockout. This is any three occasions. It is an accumulation as long as the module is turned on.

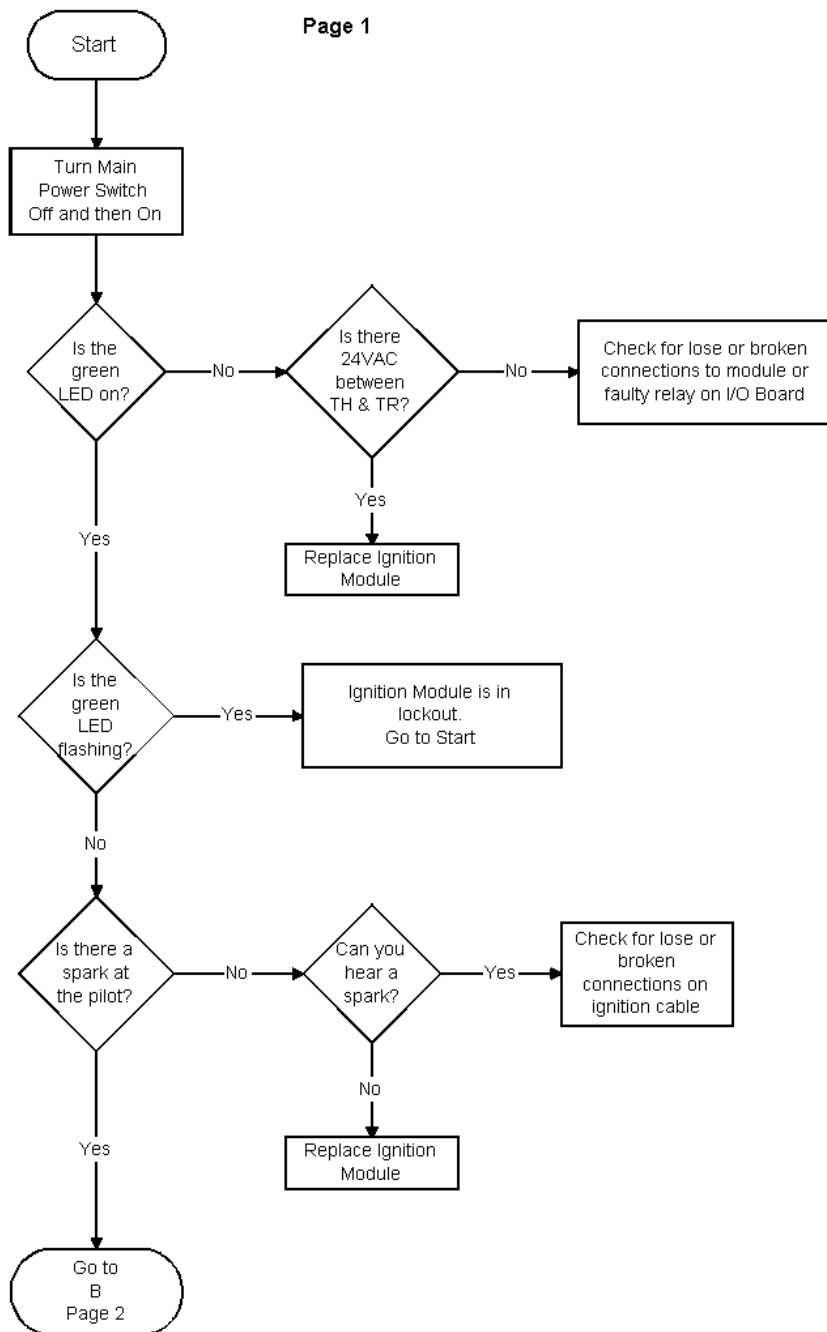
With the OFG – 32X Fryer, the control board looks at the condition of the MV terminal. If the control “sees” that the module has lost the MV voltage, even once, the control will reset the Ignition Module within 30 minutes of losing that voltage.

The OFG – 32X resets the module by cutting power to the TH terminal of the module. This resets the failure counter, internally on the module, back to zero. This helps to prevent sporadic shut downs of the module.

The PFG – 690 and OFG – 390 Fryers do not monitor the MV terminals. The modules are in complete control of the pilot flame. During initial lighting of the burner the module allows 90 seconds for the flame to establish. Should the flame fail to light, the module will lock itself out.

After the fail is established, a counter is started at zero (0). If the flame goes out or there is a loss of flame sense, the counter is incremented by one (1). The module will try to re-ignite the burner. If the burner re-lights and the flame is established for more than 10 seconds, the counter is reset to zero (0). If the flame fails again within 10 seconds, the counter is incremented again. Should the counter reach three (3), the module will lock itself out.

## Troubleshooting Flowchart



**Troubleshooting Flowchart (cont.)**

